

***Remarks***

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1, 3-7, 16-18, 30-35, 38-41, 43, 46-50, 66, 69, 71-74, 77, 78, and 83-86 are pending in the application, with claims 1, 66 and 78 being the independent claims. Claims 1, 66 and 78 have been amended to be directed to mammals in need of cancer treatment. Support for these amendments can be found throughout the specification, especially at page 104, lines 9-22. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

***Interview***

Applicants thank the Examiner for the courtesy extended in the telephone interview with the undersigned on August 18, 2005. During the interview, the pending art rejection was discussed.

***Rejections under 35 U.S.C. § 102***

Claims 1, 3-7, 30-35, 38 and 43 were rejected under 35 U.S.C. § 102(a) as allegedly being anticipated by Lawson (*J. Interferon and Cytokine Res.* 17:255-261 (1997)). Applicants respectfully traverse as it may be applied to the amended claims presented herein. To anticipate, "the reference must teach every aspect of the claimed invention either explicitly or impliedly" see M.P.E.P § 706.02. Lawson discloses the

expression of interferon  $\alpha$  in normal mice, bupivacaine-injured mice, or mice undergoing muscle regeneration caused by crush injury, but not animals in need of cancer treatment. In contrast, the pending claims require administration to a mammal in need of cancer treatment. Therefore, Lawson do not disclose every aspect of the claimed invention. Accordingly, Applicants respectfully request that the rejection be reconsidered and removed.

***Rejections under 35 U.S.C. § 103***

Claims 1, 3, 4, 7, 30, 31, 35, 38, 43 and 46-49 were rejected under 35 U.S.C. § 103 as allegedly obvious over Lawson in view of Zhang (*Proc. Natl. Acad. Sci. USA* 93:4513-4518 (1996)). Applicants respectfully traverse as it may be applied to the amended claims presented herein. To establish a *prima facie* case of obviousness: (1) the combined references must teach or suggest all the claim limitations; (2) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references; and (3) there must be a reasonable expectation of success. See M.P.E.P. § 706.02(j).

Lawson discloses the expression of interferon  $\alpha$  in normal mice, bupivacaine-injured mice, or mice undergoing muscle regeneration caused by crush injury. Only crush-injured mice demonstrated any detectable level of serum interferon  $\alpha$  (Table 4). In contrast, the pending claims require administration to a mammal in need of cancer treatment. The deficiencies of Lawson are not overcome by Zhang. Zhang discloses intratumoral injection of nude mice using an adenovirus vector encoding interferon  $\alpha$ .

Accordingly, Lawson, in view of Zhang, does not teach or suggest all of the claim limitations.

Even assuming, *arguendo*, that all elements were disclosed, one of ordinary skill in the art would not be motivated to combine the teachings of Lawson and Zhang, in fact Lawson teaches away from the combination. Since Lawson teaches that only crush-injured mice developed a systemic interferon  $\alpha$  response, the two references teach that *crush-injury is required* for development of a systemic interferon  $\alpha$  response in tumor-bearing mammals upon intramuscular injection. Applicants respectfully assert that one of ordinary skill in the art would not have been motivated to cause a *crush injury* in order to treat cancer. Therefore, there is no motivation to combine Lawson and Zhang because Lawson teaches that normal mice do not develop a systemic interferon  $\alpha$  response following intramuscular injection. Accordingly, Applicants respectfully request that the rejection be reconsidered and withdrawn.

Claims 1, 3, 7, 35, 38 and 43 were rejected under 35 U.S.C. § 103 as allegedly obvious over Lawson in view of Ogura (*Cancer Res.* 50:5102-5106 (1990)). Applicants respectfully traverse as it may be applied to the amended claims presented herein.

Lawson discloses that only crush-injured mice demonstrated any detectable level of serum interferon  $\alpha$  following intramuscular injection. In contrast, the pending claims require administration to a mammal in need of cancer treatment. The deficiencies of Lawson are not overcome by Ogura. Ogura discloses fibroblast-mediated interferon  $\alpha$  treatment of chronic myelogenous leukemia in which fibroblasts were virally infected. Accordingly, Lawson, in view of Ogura, does not teach or suggest all of the claim limitations.

Even assuming, *arguendo*, that all elements were disclosed, one of ordinary skill in the art would not have been motivated to combine the teachings of Lawson and Ogura, in fact Lawson teaches away from the combination. Since Lawson teaches that only crush-injured mice developed a systemic interferon  $\alpha$  response, the two references teach that *crush-injury* is required for development of a systemic interferon  $\alpha$  response upon intramuscular injection in mammals having chronic myelogenous leukemia. Applicants respectfully assert that one of ordinary skill in the art would not have been motivated to cause a *crush injury* in order to treat cancer. Therefore, there is no motivation to combine Lawson and Ogura because Lawson teaches that normal mice do not develop a systemic interferon  $\alpha$  response following intramuscular injection. Accordingly, Applicants respectfully request that the rejection be reconsidered and withdrawn.

Claims 66, 69, 71-73, 78 and 83-85 were rejected under 35 U.S.C. § 103 as allegedly obvious over Aoki (*Human Gene Ther.* 8:1105-1113 (1997)) in view of Lawson and Welander (*Investigational New Drugs* 5:S47-59). Applicants respectfully traverse as it may be applied to the amended claims presented herein.

Aoki discloses intraperitoneal injection of tumor-bearing mice using a plasmid encoding HSV-TK. Aoki does not disclose the use of a plasmid encoding interferon  $\alpha$ . In contrast, the pending claims require administration of a plasmid encoding interferon  $\alpha$  to a mammal in need of cancer treatment. The deficiencies of Aoki are not overcome by the combination of Lawson and Welander. As described above, Lawson discloses that only crush-injured mice demonstrated any detectable level of serum interferon  $\alpha$  following intramuscular injection. Welander also does not teach generation of serum interferon  $\alpha$  in response to intramuscular injection using a plasmid encoding interferon  $\alpha$ .

Accordingly, Aoki, in view of Lawson and Welander, does not teach or suggest all of the claim limitations.

Even assuming, *arguendo*, that all elements were disclosed, one of ordinary skill in the art would not have been motivated to combine the teachings of Aoki, Lawson and Welander, in fact Lawson teaches away from the combination. Since Lawson teaches that only crush-injured mice developed a systemic interferon  $\alpha$  response, the references teach that *crush-injury* is required for development of a systemic interferon  $\alpha$  response upon intramuscular injection in mammals having tumors. Applicants respectfully assert that one of ordinary skill in the art would not have been motivated to cause a *crush injury* in order to treat cancer. Therefore, there is no motivation to combine Aoki, Lawson and Welander because Lawson teaches that normal mice do not develop a systemic interferon  $\alpha$  response following intramuscular injection and no parallels can be drawn to intraperitoneal delivery. Accordingly, Applicants respectfully request that the rejection be reconsidered and withdrawn.

Claims 1, 3-7, 30-35, 39-41, 43 and 46-49 were rejected under 35 U.S.C. § 103 as allegedly obvious over Okamoto (*Gene Therapy* 4:969-976 (1997)) in view of Lawson. Applicants respectfully traverse as it may be applied to the amended claims presented herein.

Okamoto discloses intramuscular injection of a plasmid into mice. Okamoto does not disclose intramuscular injection of a plasmid encoding interferon  $\alpha$ . In contrast, the pending claims require administration to a mammal in need of cancer treatment. The deficiencies of Okamoto are not overcome by Lawson. As described above, Lawson discloses that only crush-injured mice demonstrated any detectable level of serum

interferon  $\alpha$  following intramuscular injection. Accordingly, Okamoto, in view of Lawson, does not teach or suggest all of the claim limitations.

Even assuming, *arguendo*, that all elements were disclosed, one of ordinary skill in the art would not have been motivated to combine the teachings of Okamoto and Lawson, in fact Lawson teaches away from the combination. Since Lawson teaches that only crush-injured mice developed a systemic interferon  $\alpha$  response, the references teach that *crush injury* is required for development of a systemic interferon  $\alpha$  response upon intramuscular injection in mammals. Applicants respectfully assert that it would not have been obvious to one of ordinary skill in the art to cause a *crush injury* in order to treat cancer. Therefore, there is no motivation to combine Okamoto and Lawson because Lawson teaches that normal mice do not develop a systemic interferon  $\alpha$  response following intramuscular injection. Accordingly, Applicants respectfully request that the rejection be reconsidered and withdrawn.

#### ***Other Matters***

Claims 1, 3, 4, 16, 17, 30-32, 35, 38-41, 43 and 46-49 were rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over claims 1, 30, 31, 34, 35, 38-44, 47, 48, 49, 51 and 52 of U.S. Patent No. 6,875,748 in view of the disclosure of the '748 patent. Applicants respectfully disagree; however, in the interests of furthering prosecution, and not in acquiescence to the Examiner's rejection, Applicants submit herewith a Terminal Disclaimer that disclaims the terminal part of the statutory term of any patent granted on this application that would extend beyond the expiration date of the full statutory terms defined in 35

U.S.C. 154 to 156 and 173 of U.S. Patent No. 6,875,748. Accordingly, Applicants respectfully request that the obviousness-type double patenting rejection based on U.S. Patent No. 6,875,748 be reconsidered and withdrawn.

### ***Conclusion***

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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